

Montakan Kunkaew 2013: Biomass Yield and Chemical Composition of Ten *Leucaena* Varieties/Lines Planted on Sandy Soil in Northeastern Thailand for Bioenergy. Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy.  
Thesis Advisor: Professor Sayan Tudsri, Ph.D. 126 pages.

The objectives of this study were to compare the growth, biomass yield, chemical composition and properties of wood suitable for bioenergy utilization of the 10 *leucaena* (*Leucaena leucocephala* (Lam.) de Wit) varieties/lines (Cunningham, Tarramba, KU3, KU15, KU19, KU38, KU39, KU45, KU48 and KU56) which were planted on sandy soil with low fertility in northeastern part of Thailand for renewable energy. The field experiment was carried out at the Buri Ram Livestock Testing Research Station, Pakham district, Buri Ram province from March 2011 to March 2013. A randomized complete block design was used with four replications. Plant spacing of 1x0.5 meters was used.

The results indicated that there were no significant differences in the plant height and stem diameter of 10 varieties/lines for both years. However, Tarramba exhibited the highest in both plant height and stem diameter, while KU 48 had the lowest stem diameter for both years. KU 56 was found to be the lowest in plant height in the first year and Cunningham was the lowest in plant height in the second year. In term of biomass yield, Tarramba achieved the highest total biomass yield and stem yield (1.4 and 1.0 ton/rai dry matter, respectively), followed by KU3 and KU45, respectively in the first year. In the second year, KU3 generated the highest biomass yield (4.9 ton/rai) followed by KU45, while Tarramba gave the highest stem yield of 3.9 ton/rai. For wood quality, there were significant differences in heating value and wood density among the tested varieties/lines. KU3 reached the highest in heating value (4.37 Kcal/g) and KU 56 was the highest in wood density. Chemical composition of the wood were significant differences among the varieties/lines of *leucaena* except hydrogen, phosphorus, potassium, NDF, ADF, hemicellulose, cellulose and ash content.

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Thesis Advisor's signature